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The Feeding Habits of the Chipping Sparrow

BY CLARENCE M. WEED

NEW HAMPSHIRE COLLEGE

AGRICULTURAL EXPERIMENT STATION

DURHAM

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DURHAM

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The Bulletins of this Station are sent free to any resident of New Hampshire upon application.

An Observation on the Feeding Habits of the Chipping Sparrow

BY CLARENCE M. WEED



IT is now generally acknowledged that birds are of great importance as checks upon insect life. The studies made by several American investigators upon the food of birds have shown beyond all doubt that these feathered allies of the farmer are essential to successful agriculture.

In the investigations yet recorded there have been comparatively few observations of the precise daily feeding habits of birds under natural conditions. This is necessarily so because of the difficulty of making such observations. In this short bulletin I wish to record a series of observations made during one long day in June (the 22d) by my assistant, Mr. W. F. Fiske, and myself upon a family of chipping sparrows (*Spizella socialis*) that had nested in a small juniper near a window from inside of which they could easily be watched. The nest contained three young sparrows, so nearly full grown that they hopped out of the nest the second day after these records were made.

The observations began at 3:40 a.m., somewhat before full daylight. The bird was then on the nest and remained there quietly for ten minutes. From this I judged that the daily task had not yet begun, it being too dark before 3:40 for even the early worm to be seen. Between 3:50 and 3:55 the bird left the nest, returning at 3:57 with a small object, apparently a piece of earthworm, in its beak. Three hungry looking mouths were widely opened, into one of which the morsel was

dropped ; then the bird settled down on the nest and remained two minutes, when it left.

Two minutes later both birds returned and fed the young. One picked up excrement from the nest, flew a few feet away, and immediately returned and sat on the nest. At 4:06 the bird on the nest left (at 4:08 the sun rose) and at 4:09 one bird returned and settled on the nest. At 4:13 it got off the nest and caught an insect of some sort on a branch of the little tree in which the nest was placed, the insect being within a foot of where the bird was sitting. This insect was fed to one young bird and the parent bird flew away. The record for the next hour was as follows :

- 4:16—One bird returned, fed, flew off with excrement.
- 4:19—One bird returned with food ; settled on nest.
- 4:25—Bird on nest flew away.
- 4:30—One bird (thought to be the male) lit in a poplar tree near by, flew from branch to branch, then flew into tree in which nest was, fed one young bird with an insect or worm, then flew away.
- 4:31—The other parent (believed to be the female) returned, fed, and settled on the nest.
- 4:34—Bird on nest flew off ; the other bird came at once, fed, and flew away.
- 4:35—A parent (believed to be the female) returned, fed, and flew away.
- 4:38—One old bird (thought to be the female again) returned, fed, and settled on the nest.
- 4:41—Bird on the nest left.
- 4:42—A parent (supposed to be the male) returned, fed, and carried away excrement.
- 4:56—Old bird (supposed to be the male again) returned with food which was given to one of the young, and carried away excrement.
- 4:58—Old bird (supposed to be the female) returned, fed one of the young, and settled on the nest a minute before flying away.
- 4:59—The other bird returned, fed one of the young ones, and cleaned the nest.
- 5:05—Old bird (thought to be the male) returned, fed nestling, and flew away.
- 5:07—One parent (probably the mother) returned, fed, brooded a moment, then flew away.
- 5:10—The same bird (apparently) returned, fed, and flew off.
- 5:12—Again the old bird believed to be the mother, returned, fed, and then settled on the nest.

The above record will give a fair idea of the activity of these parents during the day. Between 5 and 6 o'clock food was brought fourteen times; between 6 and 7, seven times; 7 and 8, eleven times; 8 and 9, twelve times; 9 and 10, ten times; 10 and 11, seventeen times; 11 and 12, ten times. The afternoon hours were equally well filled. During the first hour (12 to 1) fifteen visits to the nest were made, while the second hour saw twenty-one visits recorded. Between 2 and 3 the parents came twelve times; between 3 and 4, nine times; between 4 and 5, thirteen times; between 5 and 6, nine times; between 6 and 7, ten times. The day's work closed at 7:50, when it was too dark to see the late worm should he still be wandering about.

THE RECORD IN DETAIL

The detailed record of these observations for the remainder of the day is given below in small type. The essential facts of interest to the general reader are summarized in the paragraphs above and at the end of the bulletin:

- 5:17—The other parent (supposed to be the male) lit in a tree near by; the female flew off, and the bird in the tree came to the nest, fed one of the young, and flew away.
 - 5:20—The female (?) returned, fed, and flew away.
 - 5:26—The male (?) returned, fed, and carried away excrement.
 - 5:32—The female (?) returned, fed, and flew off.
 - 5:34—The female (?) returned, fed, and flew off.
 - 5:36—The male (?) returned, fed, and carried away excrement.
 - 5:44—The female (?) returned, fed, and flew away.
 - 5:51—The male (?) returned, fed, and flew away.
 - 5:51.5—The female (?) returned, fed, and flew away.
 - 5:56—The female (?) returned, fed, and flew away.
 - 6:06—The female (?) returned, fed, and carried away excrement.
 - 6:08—The male (?) returned, fed, and flew away.
 - 6:09—The female (?) returned and flew away without feeding the young.
 - 6:17—The female (?) returned, fed, and flew away.
 - 6:28—One parent returned, fed, and flew away.
 - 6:34—One parent returned with a large, green worm; the nestling to which it was given had considerable difficulty in swallowing it.
 - 6:39—One bird returned with some small insect.
 - 6:44—One parent brought a small, dark-colored larva resembling that of a saw-fly.
- (A man working a lawn-mower near the nest was probably the cause of this interval of sixteen minutes.)

- 7:00—Both birds returned at the same time. The object carried by the male was too small to be identified, while the female had a large, green caterpillar, apparently a noctuid larva. This larva was so large that the nestling could not swallow it without assistance from the parent. When the mother came to the nest, the larva was held in the bill transversely. Before it was given to the nestling the larva was turned around so that it ran lengthwise of the bill.
- 7:14—One parent brought a dark-colored caterpillar and carried away excrement.
- 7:15—One bird, thought to be the male, has been on a small poplar tree near the nest for the last minute with something in its bill. It has just flown to the tiny cedar shrub near by, then to the tree in which the nest is placed, and back to the poplar at once.
- 7:17—The bird in the poplar flew to the nest and fed young. The other parent made a flying visit to the poplar and flew away.
- 7:22—One old bird appeared with a large caterpillar, alighting on the poplar a moment before flying to the nest to give it to a nestling.
- 7:39—One bird brought a rather large, grey caterpillar and carried away excrement.
- 7:44—Both birds returned at once, the male with a large larva, apparently a noctuid (the group to which the cutworms belong).
- 7:52—One parent brought a large, greyish caterpillar.
- 7:56—One bird, thought to be the male, returned with food and carried away excrement.
- 7:58—Parent returned with a worm, fed, carried away excrement.
- 8:05—One parent returned with a small insect, fed, and flew away.
- 8:09—Parent returned with food, then flew away.
- 8:12—One parent returned, fed, and flew away.
- 8:17—One parent returned, fed, and flew away.
- 8:24—One bird returned to the small poplar tree with a larva, apparently a noctuid, in its mouth. It seemed afraid to go to the nest and remained in the poplar four minutes. Then the other parent returned to the poplar with a worm, looked around a moment, flew to the nest, fed the worm to one of the nestlings, and flew away. Meanwhile, the other adult swallowed its worm and flew off without visiting the nest.
- 8:39—One old bird visited the tree in which the nest was for a moment and then flew away without feeding the young.
- 8:40—Both parents came at once and fed; one, supposed to be the male, carried away excrement.
- 8:43—One old bird, apparently the mother, brought a small, dark brown caterpillar, which was fed to a nestling, and carried away excrement.
- 8:44—One bird (the male[?]) brought small objects, fed, and flew away.

- 8:45—The other bird (the female [?]) brought small objects, fed young, and cleaned the nest.
8:47—One parent (the mother [?]) brought a blackish caterpillar and flew away as soon as it was given to a nestling.
8:58—One parent brought a medium-sized, greenish caterpillar.
9:01—One bird (the male [?]) brought some small insect, fed, and flew away.
9:06—The mother (?) brought a large, green caterpillar.



FIG. 1.—A CRANE-FLY (Eaten by Young Chipping Sparrows).

- 9:07—The male (?) brought some small object.
9:12—The female (?) brought a very large, green caterpillar.
9:13—The male brought some small object.
9:26—One bird brought a large, green caterpillar, large enough to be the larva of *Amphipyra pyramidoides*, and of very much the appearance of that species.
9:38—Both birds returned to the nest at the same time; one had a rather small larva, and the other a large, pale green one. One bird cleaned the nest.
9:39—One bird brought a small, dark caterpillar, and carried away excrement.

- 9:51—One bird brought a large, green caterpillar, coming through the east side of the tree.
- 10:13—One bird came to north side of tree with very small object; carried away excrement.
- 10:16—Bird entered tree by north side with small object which was fed to one of the nestlings. The parent remained for some time looking over the young birds.
- 10:17—Old bird came through east side with what appeared to be a white grub in its mouth; fed to young and flew away.
- 10:19—Old bird entered by north side with some small object; waited some moments after feeding the nestling, then settled on the nest and warmed the young.
- 10:24—One of the parents came through the east side of the tree with a large, green worm; one of the nestlings ate it and immediately opened its mouth for more.
- 10:25—Other parent entered from north side of tree with small object.
- 10:28—Bird entered from north side again with small, black insect.
- 10:30—Bird entered from north side with very small object.
- 10:34—Bird entered from north side with very small object.
- 10:38—Both birds came at the same time: as usual, the one that entered by the north side brought a small object, and the other a large, parti-colored caterpillar. The second bird carried away excrement.
- 10:41—Bird entered from north side with a small object.
- 10:43—Bird entered from north side with a small object.
- 10:44—Bird came through the east side with a large caterpillar, believed to be the larva of *Amphipyra pyramidoides*.
- 10:47—Bird came through north side carrying at least two small objects, one of which was given to one nestling and the other to another.
- 10:54—Bird entered from north side.
- 10:59—Bird entered from north side.
- 11:10—Bird entered from north side.
- 11:14—Bird entered from north side, carrying a larva supposed to be a *Drepanulid*.
- 11:20—Bird entered from east side with a large caterpillar.
- 11:23—One bird came from north side with food.
- 11:24—Bird came from east side with large caterpillar. (It is noticed that the nestling that is fed opens its mouth the widest immediately afterwards.)
- 11:30—Bird entered from north side with a small object, and carried away excrement.
- 11:39—Large caterpillar brought through the east side.
- 11:40—Small object brought through north side.
- 11:46—Black caterpillar brought through north side.
- 11:54—Bird entered from east side with brown caterpillar; carried away excrement.
- 12:01—Bird entered from east side with brown caterpillar.
- 12:02—Bird returned and fed young.
- 12:06—Bird returned and fed young.

- 12:10—Bird returned and fed young.
12:18—Bird returned from north side with a green caterpillar, apparently a cabbage worm.
12:24—Bird entered from north side with a good-sized insect.
12:28—Bird entered from north side with a green caterpillar.
12:36—Parent came from east side with a caterpillar.
12:37—Young fed by bird entering north side of tree.
12:38—Young fed by bird entering north side of tree.
12:41—Young fed by bird entering north side of tree.
12:44—Young fed by bird entering north side of tree.
12:48—Bird came through east side of tree with small object.
12:51—Bird came through north side; carried away excrement.
12:56—Bird came through east side with a blackish caterpillar.
1:01—Parent came through north side.
1:05—Both parents returned at once; one came through north side of tree with small object, and the other by east side with a green, downy caterpillar.
1:06—One bird brought a brown caterpillar, entering the tree from the north side.
1:07—Bird brought greenish, black caterpillar through east side of tree.
1:11—Bird entered north side of tree carrying small object.
1:13—Bird entered north side of tree carrying small object.
1:14—Bird entered east side of tree carrying large caterpillar.
1:16—Bird entered north side of tree.
1:24—Bird entered north side.
1:25—Bird entered east side.
1:26—Bird entered north side.
1:27—Bird entered north side.
1:28—Bird entered north side.
1:30—Bird entered north side.
1:36—Bird entered north side; carried away excrement.
1:36.5—Bird entered north side.
1:37—One bird brought a large caterpillar, coming through east side of tree.
1:40—Bird entered north side.
1:51—Bird entered east side.
1:56—Bird entered east side.
2:07—Bird entered east side; carried away excrement.
2:18—Bird entered east side.
2:28—One parent brought a very large caterpillar, coming in at the east side of tree.
2:29—Bird entered north side of tree with small objects, which were fed to two nestlings.
2:33—Bird entered by north side.
2:39—Both parents came at once, each bringing a good-sized caterpillar.
2:41—One bird came through north side with a small caterpillar.
2:45—Bird came through north side.
2:54—Bird came through east side.

- 2:58—One parent brought a large crane-fly (Fig. 1), entering the tree on the east side, and carried away excrement.
- 2:59—Bird fed nestlings, coming from the north side.
- 3:11—Bird fed nestlings, coming from the north side.
- 3:15—Bird fed nestlings, coming from the north side.
- 3:18—Bird fed nestlings, coming from the north side; carried away excrement.
- 3:26—Both birds came at once, having been searching the lawn near by for a few minutes preceding.
- 3:28—One bird came to nest, entering north side.
- 3:29—Bird brought small object through east side.
- 3:33—Bird came with food from north side.
- 3:42—Bird came with food from north side.
- 4:01—Bird came with food from east side.
- 4:05—Bird came with a caterpillar from north side.
- 4:09—Bird came with food from north side.
- 4:13—Bird came with food from east side.
- 4:16—Bird brought food, entering at east side.
- 4:24—Bird brought food, entering at north side.
- 4:38—An exceptionally large caterpillar brought through east side.
- 4:43—Bird brought food, entering at north side.
- 4:45—Bird brought food, entering at north side; carried away excrement.
- 4:45.5—A large caterpillar was brought in at east side; excrement removed.
- 4:46—Bird brought food, entering at east side.
- 4:52—Bird brought food, entering at north side.
- 4:56—Bird brought a caterpillar, entering at north side. Settled on nest to remain four minutes.
- 5:23—Both birds came at once, one carrying a small object, and the other a caterpillar.
- 5:25—Bird brought food, entering at north side; carried away excrement.
- 5:33—Bird brought food, entering at east side; carried away excrement.
- 5:39—Bird brought food, entering at north side.
- 5:42—Bird brought food, entering at east side.
- 5:45—Bird brought food, entering at north side; fed two nestlings.
- 5:50—Bird brought food, entering at north side.
- 5:59—Bird brought food, entering at north side; carried away excrement.
- 6:01—A caterpillar brought in north side; excrement carried away.
- 6:06—A black insect, apparently a cricket, brought in north side.
- 6:15—Small objects brought in at north side.
- 6:17—Small objects brought in at north side.
- 6:25—A caterpillar brought: excrement carried away.
- 6:33—Caterpillar brought through east side.
- 6:34—Food brought through north side.
- 6:38—Caterpillar brought; excrement carried away.
- 6:45—Food brought in at north side; excrement carried away.

- 6:57—Food brought in at north side; excrement carried away.
7:10—Food brought in at north side.
7:16—Food brought in at north side. The sky is clouded, and the atmosphere is now becoming dark.
7:27—Both parents returned; one came through east side, and the other through the north side. One had a large caterpillar, and the other apparently also had one. Both fed and flew away at once.
7:36—One bird came in at north side; fed and flew away at once.
7:49—Now quite dark. One bird flew in, probably the female, got on the nest a moment and then got off and wandered round the tree a minute. Then at 7:50 it settled down on the nest. The young birds poked their heads up for two or three minutes, but the old bird remained quiet, and the young soon withdrew their heads. This was the end of the day's work for the busy parents.

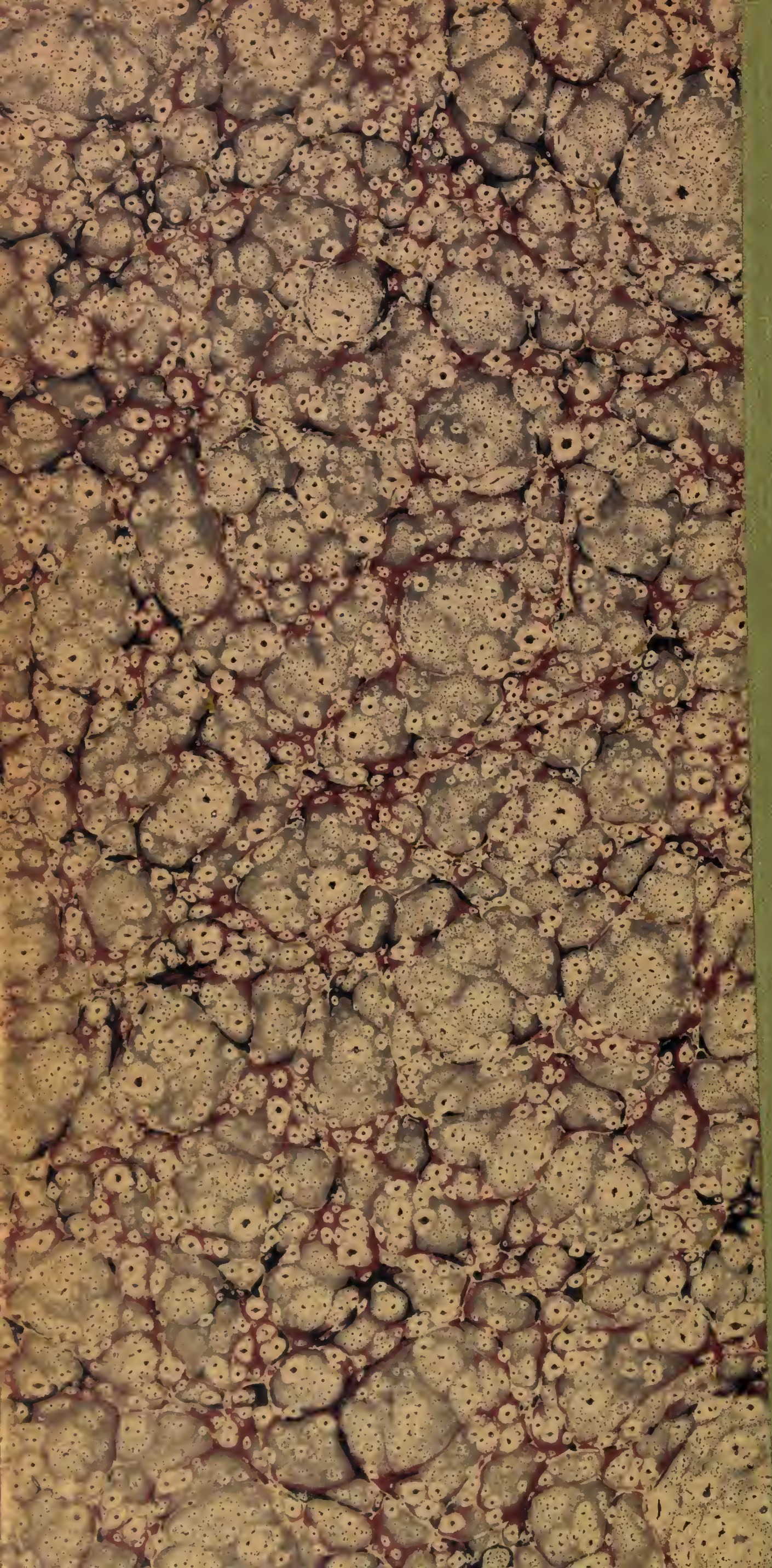
The reason that the side of the tree through which the birds entered was recorded was that it was believed that one of the parents always came through the north side, and the other the east side. But the difference in the sexes is so slight that it was impracticable to be certain of the facts of the case.

SUMMARY AND CONCLUSION

During this busy day the parent birds had made almost two hundred visits to the nest, bringing food nearly every time, though some of the trips seemed to be made to furnish grit for the grinding of the food. There was no long interval when they were not at work, the longest period between visits having been twenty-seven minutes. Soft-bodied caterpillars were the most abundant elements of the food, but crickets and crane-flies (Fig. 1) were also seen, and doubtless a great variety of insects was taken. The precise determination of the most of the food brought was, of course, impossible, the observations having been undertaken especially to learn the regularity of the feeding habits of the adult birds. That they were busy from daylight to dark with no long intermission at any time is shown by the record, and the observation is submitted as a contribution to our knowledge of a subject in which much guessing has been done on account of the lack of definite information.

The chipping sparrow is one of the most abundant and familiar of our birds. It seeks its nesting site in the vicinity of

houses, and spends most of its time searching for insects in grass lands, or cultivated fields and gardens. In New England two broods are usually reared each season. That the young keep the parents busy catching insects and related creatures for their food is shown by the record on the preceding pages. The bird certainly deserves all the protection and encouragement that can be given it.



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